

# Health Consultation

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SOUTH CALIFORNIA CHEMICAL  
UNION, MCHENRY COUNTY, ILLINOIS

CERCLIS NO. ILD059483081

JUNE 11, 1999

**U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES**

**Public Health Service**

Agency for Toxic Substances and Disease Registry

Division of Health Assessment and Consultation

Atlanta, Georgia 30333

## **Health Consultation: A Note of Explanation**

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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# HEALTH CONSULTATION

SOUTH CALIFORNIA CHEMICAL  
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Prepared by:

Illinois Department of Public Health  
Under Cooperative Agreement with the  
Agency for Toxic Substances and Disease Registry

## BACKGROUND AND STATEMENT OF ISSUES

The Illinois Environmental Protection Agency (Illinois EPA) asked the Illinois Department of Public Health (IDPH) to review the environmental data available for the Southern California Chemical Company (SCC) dump site to determine if a public health hazard exists [1]. The SCC facility and dump site are at 17415 Jefferson Street in Union, McHenry County, Illinois. The dump site occupies 5 acres of land adjacent to the eastern edge of the SCC facility. The dump site is bordered on the north by Jefferson Street, on the east by a vacant lot, and on the south by the Chicago and Northwestern railroad tracks (Attachment 1).

Access to the dump site is not completely restricted. A 6-foot-high, chain link fence surrounds the dump site on the west and north boundaries, but the fencing on the north edge is incomplete and allows access. Fencing does not exist on the south and east boundaries of the dump site. The dump site has a thick grass and scrub brush covering.

SCC began chemical manufacturing operations in 1970 and continued until 1988. During that time, SCC was involved in the manufacture of various inorganic chemicals, including copper sulfate pentahydrate and copper oxide, proprietary and patented continuous ammonia etchants, as well as recycling and refining spent circuit boards. The company had several hazardous waste storage containers, including six aboveground storage tanks of 6,000 to 10,000 gallon capacity, and space for up to twelve hundred 55-gallon drums [1]. The dump site was used to deposit fragments of printed circuit boards.

Illinois EPA listed SCC for closure under the Resource Conservation and Recovery Act (RCRA), and the 2.5-acre area used for manufacturing is undergoing RCRA closure activities. This closure process does not include the dump site.

On March 19, 1998, Illinois EPA performed a site reconnaissance visit to determine potential soil sampling locations. During the visit, X-ray fluorescence (XRF) readings were taken to determine possible areas of metal contamination on the dump site. Readings also were taken from the property directly across Jefferson Street. This property is owned by Techalloy, a manufacturing facility northeast of the dump area (Attachment 2).

On April 14 and 15, 1998, Illinois EPA collected five on-site soil samples, four off-site soil samples, and one background soil sample. The background soil sample was collected at Union Park, approximately one-half mile northwest of the dump site. Illinois EPA also collected three off-site groundwater samples, three on-site groundwater samples, and a background groundwater sample. The background groundwater sample was collected from Union public water supply well number 4, (b) (9). Soil samples were collected at depths of 3 to 3.5 feet, 4 to 6 feet, 5 to 7 feet, 7 to 8 feet, 7.5 to 8.5 feet, and 8 to 10 feet. All samples were collected using a Geoprobe and analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, and inorganic chemicals. The purpose of this

sampling was to determine the presence of contamination on the dump site and to what extent off-site migration may have occurred.

## DISCUSSION

IDPH compared the results of each soil and groundwater sample collected with the appropriate screening comparison values used to select contaminants for further evaluation for carcinogenic and non-carcinogenic health effects. Chemicals found at levels greater than comparison values or those for which no comparison value exists were selected for further evaluation and are shown on Tables 1 through 5. A discussion of each comparison value used is found in Attachment 3.

Analyses of the XRF samples taken in March 1998 revealed elevated levels of lead (128.7 parts per million [ppm]), arsenic (66.4 ppm), mercury (50.8 ppm), cobalt (1,079.2 ppm), copper (22,080 ppm) and chromium (634.4 ppm). The results of these samples and the maximum concentration of each contaminant found are summarized in Table 1.

The maximum concentration of each contaminant of interest collected during the April 1998 sampling are summarized in Tables 2, 3, 4, and 5. Several chemicals were found in soil and groundwater samples collected on and off the site. Laboratory analyses of on-site soil samples showed the presence of one VOC, polycyclic aromatic hydrocarbons (PAHs), pesticides, and several inorganic chemicals. Off-site soil samples contained one VOC, one SVOC, and several inorganic chemicals.

Groundwater samples collected on the dump site showed the presence of VOCs, SVOCs, one pesticide, and several inorganic chemicals. Groundwater samples collected from off-site locations showed the presence of VOCs, one SVOC, and inorganic chemicals. The only contaminant of interest in on-site groundwater was manganese. Manganese was found in three of the on-site groundwater samples and each of the three off-site samples. Benzene (54 ppb) is a contaminant of interest in one of three off-site samples (G107). That sample was collected approximately 675 feet north of the SCC dump site, from the Techalloy field. No one is drinking this water, but private wells are downgradient from this point.

The main route of exposure to chemicals at the SCC dump site is contact with surface soil by ingestion, inhalation, and dermal absorption (Table 6). Evidence suggests that the dump site may be occasionally used by area children for recreational activities. An individual can be exposed to contaminants in soil by contacting, ingesting, or inhaling soil and dust from the surface layer of soil ranging from zero to three inches in depth. Illinois EPA collected the SCC soil samples from a depth of 3 feet to 10 feet. Samples collected at these depths do not represent surface soil. Without surface soil data, IDPH assumed that the contaminants present in XRF samples collected during the site reconnaissance visit represent surface soil. Contaminants of interest in on-site soil are lead, mercury, arsenic, and chromium.

The deeper Geoprobe samples collected by Illinois EPA do not present an accurate representation of surface contamination. Still, construction activities could expose workers and nearby residents to this soil by generating contaminated dust and bringing contaminated soil to the surface. The contaminants of interest in this layer of soil are arsenic, beryllium, chromium, lead, and benzo(a)pyrene.

IDPH calculated estimated exposure doses for adults and children, based on exposure during play on the dump site. IDPH used the XRF data, a frequency of play of twice per week, 30 weeks per year, to calculate the estimated doses. IDPH believes these assumptions are conservative and represent an over-estimation of what exposure may actually be because evidence suggests that trespass is occasional. Estimated doses were then compared with minimal risk levels (MRLs). The MRL is a health screening guideline used to determine whether the exposure should be further evaluated. Based on this exposure scenario, none of the contaminants of interest in surface soil exceeded MRLs.

## **CONCLUSIONS**

Based on the information reviewed, IDPH concludes that no apparent public health hazard exists in association with the contaminants detected in on-site and off-site soil at the SCC dump site. Exposure to site-related contamination is probably taking place, but not at levels that would be a public health hazard. If site access is restricted, then all current exposure can be eliminated. Groundwater contamination is a concern if benzene migrates towards off-site private and public wells in the area.

## **RECOMMENDATIONS**

IDPH recommends:

1. that access to the dump site be restricted to reduce the potential for exposure;
2. additional groundwater sampling be done to determine the source and extent of benzene contamination in off-site groundwater and the potential for benzene to impact downgradient wells.

## **PREPARER OF REPORT**

Aaron Martin  
Environmental Toxicologist  
Illinois Department of Public Health

## REFERENCES

1. CERCLA STEP Inspection, Southern California Chemical Company (ILD 059483081). Illinois Environmental Protection Agency, Springfield. Illinois. 1998.
2. ATSDR Toxicological Profiles on CD-ROM for Arsenic. ATSDR, 1997.
3. ATSDR Toxicological Profiles on CD-ROM for Lead. ATSDR, 1997.
4. A Summary of Selected Background Conditions for Inorganics in Soil. Illinois Environmental Protection Agency, Springfield, Illinois. August 1994.
5. ATSDR Draft Update Toxicological Profile for Manganese. ATSDR, September 1997.
6. ATSDR Toxicological Profile for Mercury. ATSDR, May 1994.
7. ATSDR Toxicological Profile for Chromium. ATSDR, April 1993.
8. ATSDR Toxicological Profile for Cobalt. ATSDR, July 1992.
9. ATSDR Toxicological Profile on CD-ROM for Copper. ATSDR, 1997.

## CERTIFICATION

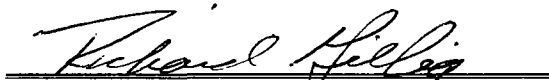
This Health Consultation for Southern California Chemical was prepared by the Illinois Department of Public Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the Health Consultation was initiated.



Gail Godfrey

Technical Project Officer, SPS, SSAB, DHAC

The Division of Health Assessment and Consultation (DHAC), ATSDR, has reviewed this Health Consultation and concurs with its findings.



Richard Billig

Section Chief, SPS, SSAB, DHAC, ATSDR



**Table 1. XRF Sampling of Inorganic Chemicals in On-site and Off-site Surface Soil.**

<b>Chemical</b>	<b>Sample Concentration (ppm)</b>	<b>Sample Location</b>	<b>Comparison Value</b>
Arsenic	66.4	40	20ppm (EMEG)
Mercury	50.8	1	None
Copper	22,080	25	None
Cobalt	1,079.2	27	None
Iron	27,059	25	None
Chromium	634.6	34	200ppm (RMEG)*

EMEG: Environmental Media Evaluation Guide

RMEG: Reference Dose Media Evaluation Guide

\* Comparison Value for Chromium IV

**Table 2. Inorganic Chemicals of Interest in On-site and Off-site Subsurface Soil.**

<b>Chemical</b>	<b>Sample Concentration (ppm)</b>	<b>Sample Location</b>	<b>Comparison Value</b>
Antimony	42.9	X102	20ppm (RMEG)
Arsenic	25.7	X102	20ppm (EMEG)
Beryllium	2.2	X102	0.2ppm (CREG)
Chromium	2,180	X102	200ppm (RMEG)*
Cobalt	14.1	X102	None
Copper	44,600	X102	None
Iron	134,000	X102	None
Lead	1,240	X103	None

EMEG: Environmental Media Evaluation Guide

CREG: Cancer Risk Evaluation Guide for 1x10E-6 excess cancer risk

RMEG: Reference Dose Media Evaluation Guide

\* Comparison Value for Chromium IV

**Table 3. Chemicals of Interest in On-site Groundwater**

<b>Contaminant</b>	<b>Concentration (ppb)</b>	<b>Sample Location</b>	<b>Comparison Value</b>
Manganese	272	G101	50 (RMEG)
Copper	732	G101	None
Iron	342	G104	None
Magnesium	31,800	G104	None

ppb - part per billion

RMEG - Reference Dose Media Evaluation Guide

**Table 4. Chemicals of Interest in Off-Site Groundwater**

<b>Contaminant</b>	<b>Concentration (ppb)</b>	<b>Sample Location</b>	<b>Comparison Value</b>
Benzene	54	G107	5 (MCL)
Barium	1,280	G501, G502	2,000 (MCL)
Cobalt	13.2	G502	None

MCL - Maximum Contaminant Level

ppb - part per billion

**Table 5: Semi-Volatile Contaminants in On-site and Off-site sub-surface soil.**

<b>Contaminants</b>	<b>Sample Concentration (ppb)</b>	<b>Sample Location</b>	<b>Comparison Values</b>
Benzo(a)anthracene	40,000	X102	None
Chrysene	42,000	X102	None
Benzo(b)fluoranthene	32,000	X102	None
Benzo(k)fluoranthene	31,000	X102	None
Benzo(a)pyrene	32,000	X102	100 ppb (CREG)
Indeno(1,2,3-cd)pyrene	18,000	X102	None
Benzo(g,h)perylene	15,000	X102	None

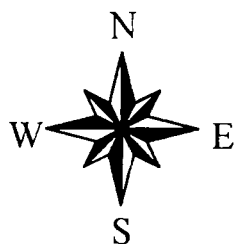
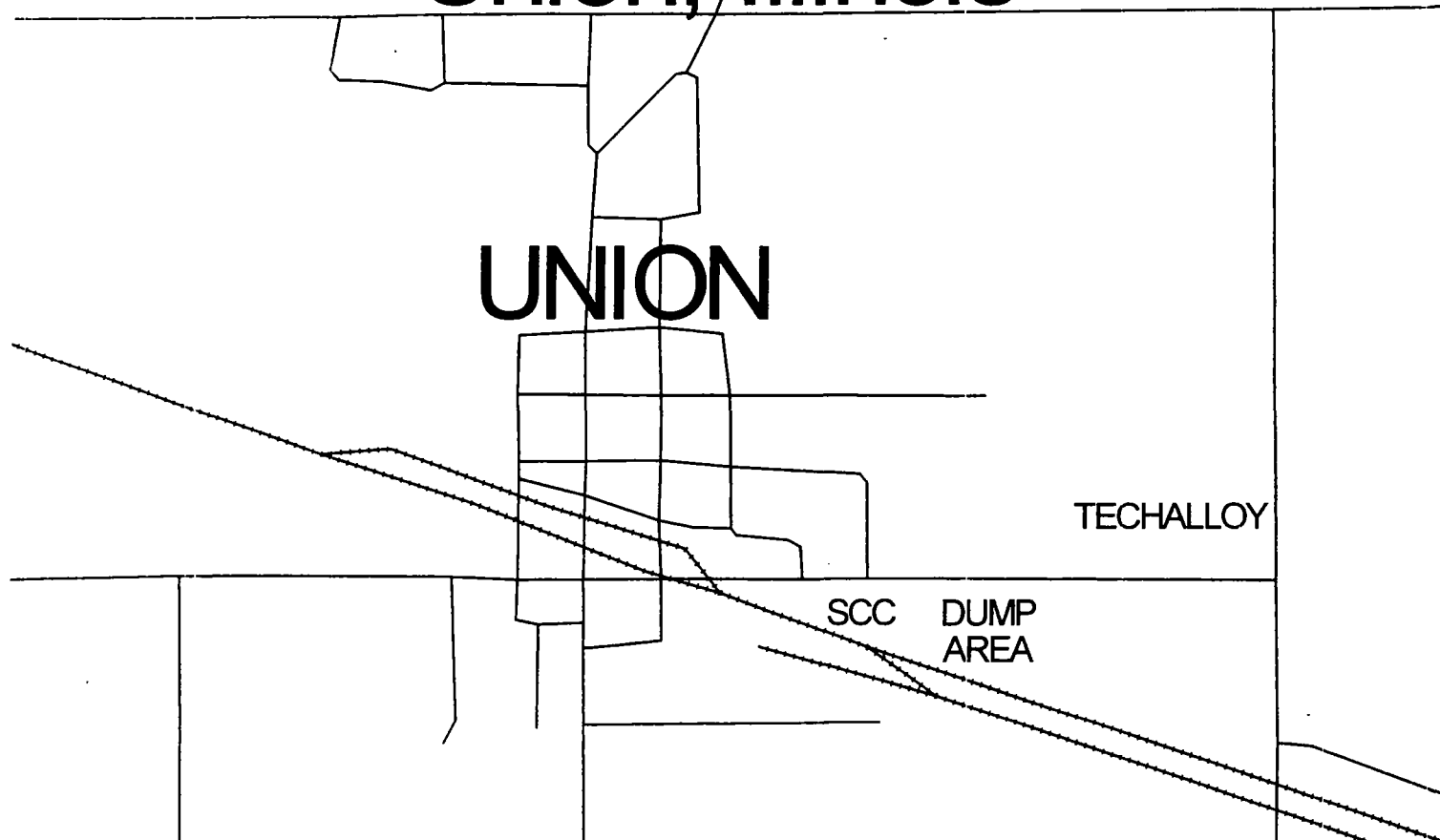
J - Estimated Value; contaminant fell below laboratory detection limits

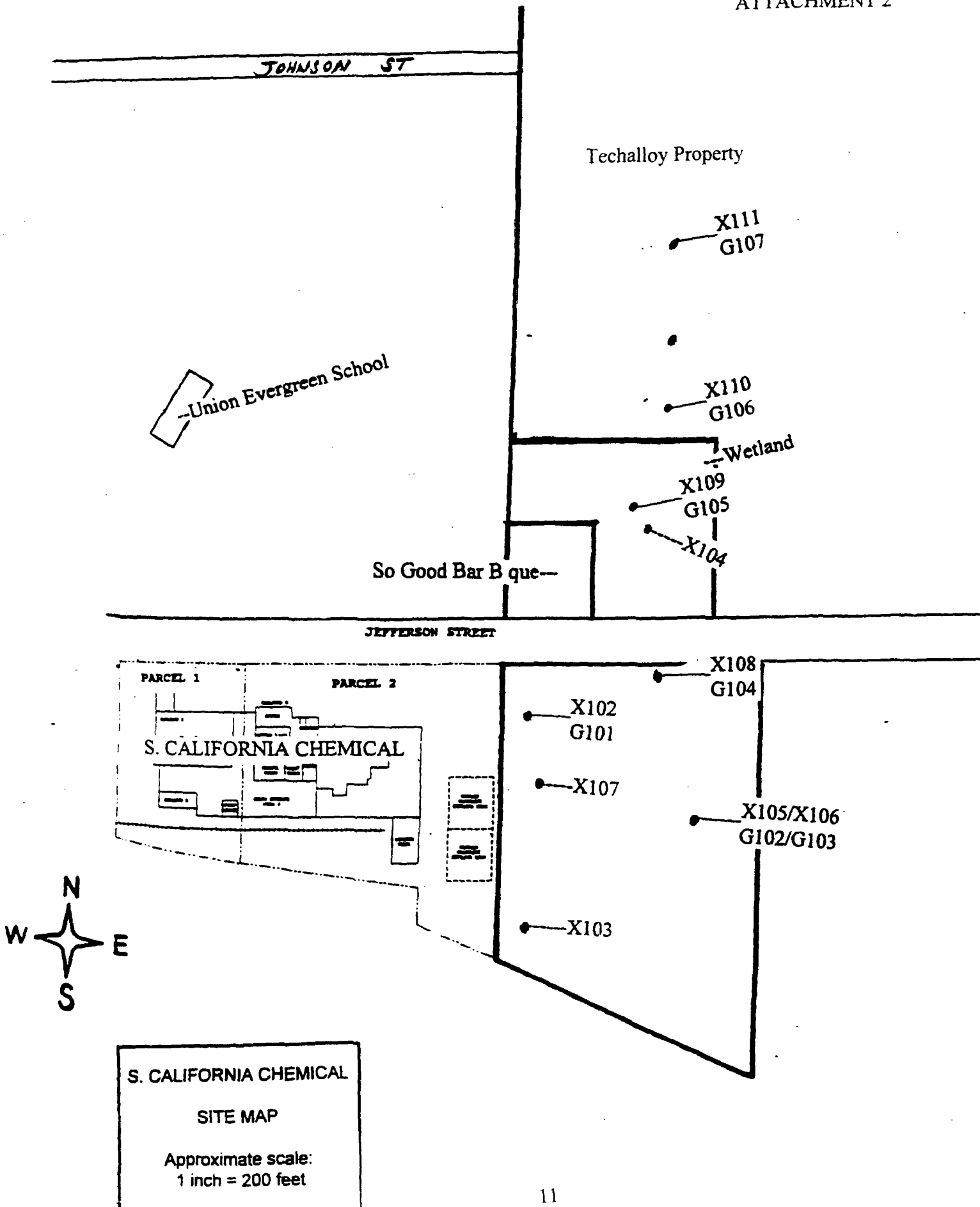
CREG - Cancer Risk Evaluation Guide

**Table 6. Completed and Potential Exposure Pathways.**

<b>Pathway Name:</b>	<b>Source</b>	<b>Medium</b>	<b>Exposure Point</b>	<b>Exposure Route</b>	<b>Receptor Population</b>	<b>Time of Exposure</b>	<b>Exposure Activities</b>	<b>Estimated Number Exposed</b>	<b>Chemicals</b>
<b>Surface Soil (complete)</b>	<b>SCC</b>	<b>Soil</b>	<b>SCC Dump Area</b>	<b>Ingestion Inhalation Dermal</b>	<b>Trespassers</b>	<b>Past Present Future</b>	<b>Playing with soil on the site.</b>	<b>30</b>	<b>Table 1</b>
<b>Sub-surface Soil (potential)</b>	<b>SCC</b>	<b>Soil</b>	<b>SCC Dump Area</b>	<b>Ingestion Inhalation Dermal</b>	<b>On-site Workers</b>	<b>Future?</b>	<b>Excavation on the site</b>	<b>10</b>	<b>Tables 2 &amp; 5</b>
<b>Ground water (potential)</b>	<b>unknown</b>	<b>Ground Water</b>	<b>Area wells</b>	<b>Ingestion Inhalation Dermal</b>	<b>Area residents</b>	<b>Future?</b>	<b>Using private water</b>	<b>100</b>	<b>Tables 3 &amp; 4</b>

# Location of Southern California Chemical, Union, Illinois





### **Comparison Values Used In Screening Contaminants For Further Evaluation**

Environmental Media Evaluation Guides (EMEGs) are developed for chemicals based on their toxicity, frequency of occurrence at National Priority List (NPL) sites, and potential for human exposure. They are derived to protect the most sensitive populations and are not action levels, but rather comparison values. They do not consider carcinogenic effects, chemical interactions, multiple route exposure, or other media-specific routes of exposure, and are very conservative concentration values designed to protect sensitive members of the population.

Reference Dose Media Evaluation Guides (RMEGs) are another type of comparison value derived to protect the most sensitive populations. They do not consider carcinogenic effects, chemical interactions, multiple route exposure, or other media-specific routes of exposure, and are very conservative concentration values designed to protect sensitive members of the population.

Cancer Risk Evaluation Guides (CREGs) are estimated contaminant concentrations based on a probability of one excess cancer in a million persons exposed to a chemical over a lifetime. These are also very conservative values designed to protect sensitive members of the population.

Maximum Contaminant Levels (MCLs) have been established by USEPA for public water supplies to reduce the chances of adverse health effects from contaminated drinking water. These standards are well below levels for which health effects have been observed and take into account the financial feasibility of achieving specific contaminant levels. These are enforceable limits that public water supplies must meet.

Lifetime Health Advisories for drinking water (LTHAs) have been established by USEPA for drinking water and are the concentration of a chemical in drinking water that is not expected to cause any adverse non-carcinogenic effects over a lifetime of exposure. These are conservative values that incorporate a margin of safety.